# Strategic Weapons in the 21st Century
# The U.S. Nuclear Deterrent in 2030 and Beyond: Fit for Purpose?

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Recommended Background Reading

Key Questions:

- What are the key challenges facing U.S. and allied nuclear policymakers in 2021?
- What more can be done to increase the effectiveness of nuclear deterrence?
- Will the overall U.S. strategic posture be fit for purpose in 2030?
- Will the U.S. nuclear posture be fit for purpose?

*Panel 1: Scoping the 2021 Global Nuclear Challenge*

- From the perspective of U.S. nuclear deterrence and assurance requirements, what factors have changed in the security environment since the 2009 and 2017 reviews?
- What implications follow for the U.S./allied practice of nuclear deterrence?

"Annual Threat Assessment of the US Intelligence Community." Office of the Director of National Intelligence, Washington DC (April 9, 2021). https://www.intelligence.senate.gov/sites/default/files/documents/2021-04-09%20Final%20ATA%202021%20%20Unclassified%20Report%20-%20rev%202.pdf.

The report highlights how both Russia and China have expanded their strategic military toolkit and are increasingly able to challenge U.S. leadership in emerging technologies. Their desire to establish preeminence in regional affairs destabilizes international norms and relationships.

Colby, Elbridge. "How to Win America's Next War." *Foreign Policy* (May 2019). https://foreignpolicy.com/2019/05/05/how-to-win-americas-next-war-china-russiamilitaryinfrastructure/.

This essay details what America must do to win its next war. Colby argues that past U.S. approaches to conflict will no longer be successful, as Russia and China have tailored their strategies to counter American power projection capabilities. Colby concludes that the U.S. must forgo further involvement in secondary conflicts and theaters and rethink its relationship with allies.

Cox, Jessica. "Introduction." In *Recalibrating NATO Nuclear Policy*, edited by Andrea Gilli. NATO Defense College Research Paper No. 10 (June 2020): 1-4. https://www.ndc.nato.int/download/downloads.php?icode=652.

Cox highlights that nuclear weapons have been the foundation of NATO's collective security since its inception. The Alliance has nuclear weapons because nuclear deterrence is still necessary and its principles still work. NATO must be able to deter nuclear threats and potentially respond to nuclear use by Russia.

Roberts, Brad. "Orienting the 2021 Nuclear Posture Review." *The Washington Quarterly* 44, no. 2 (2021): 123-142. https://cpb-us-e1.wpmucdn.com/blogs.gwu.edu/dist/1/2181/files/2019/03/Roberts_TWQ_44-2.pdf.

Roberts argues that the Biden administration's work to turn its policy goals into a practical governance agenda must begin with a realistic appreciation of developments in the global security environment. Restoring U.S. leadership in nuclear diplomacy should embrace nuclear deterrence as part of the solution.

Perkovich, George and Pranay Vaddi. "Proportionate Deterrence: A Model Nuclear Posture Review," Wahington, DC: Carnegie Endowment for International Peace (January 2021) https://carnegieendowment.org/files/Perkovich_Vaddi_NPR_full1.pdf.

The authors take stock of the dilemmas, uncertainties, and tradeoffs that come with current and possible alternative nuclear policies and forces. They analyze declaratory policy, unclassified employment policy, and plans for offensive and defensive force postures, and propose changes to several of them.

*Panel 2: Coming to Terms with the Multi-Domain Deterrence Challenge*

- How is the emerging competition for strategic advantage in emerging technologies affecting strategic stability and deterrence?
- What would be an "appropriate mix" of strategic capabilities in 2030 (including nonnuclear strike missile defenses, cyber, and space capabilities, in addition to nuclear)?
- Relative to the predicted Russian and Chinese strategic postures of 2030, will the U.S. position have improved, stayed the same, or eroded? Why?

Miller, James N. and Richard Fontaine. "A New Era in U.S.-Russian Strategic Stability: How Changing Geopolitics and Emerging Technologies are Reshaping Pathways to Crisis and Conflict." Washington, DC: Center for a New American Security (September 2017). A New Era in U.S.-Russian Strategic Stability | Center for a New American Security (en-US) (cnas.org)

In their report, Miller and Fontaine argue that parallel changes in U.S.-Russian political relations and the military-technological landscape are fundamentally reshaping the ways in which a potential crisis and conflict would likely unfold. They analyze three distinct pathways to future U.S.-Russia crisis and conflict.

Gottemoeller, Rose. "The Standstill Conundrum: Coming Vulnerability of Second-Strike Deterrent Forces." Livermore, CA: Center for Global Security Research – Lecture Series (May 2021). https://cgsr.llnl.gov/event-calendar/2021/2021-05-17.

> Gottemoeller warns that emerging and disruptive technologies, especially sensors, may begin to challenge what the U.S. has considered in the past seven decades to be a stable and survivable nuclear force structure. She explores the implications, in particular, to the secure second-strike retaliatory capability of the U.S.

Obering, Henry and Rebeccah L. Heinrichs. "Missile Defense for Great Power Conflict: Outmaneuvering the China Threat." *Strategic Studies Quarterly* 13, no. 4 (2019): 37-56. https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-13_Issue-4/Heinrichs.pdf.

> China is modernizing its military to establish regional hegemony in the near term and global preeminence in the far term. The authors argue that to meet this challenge, it is imperative that the United States adapt its missile defense policy and strategy and leverage new technology.

Durkalec, Jacek, et al. "Multi-Domain Complexity and Strategic Stability in Peacetime, Crisis and War." Livermore, CA: Center for Global Security Research (February 2021). https://cgsr.llnl.gov/content/assets/docs/CGSR_Annotated_Bibliography_Emerging_Tech.pdf.

> The expansion of military competition into new technical domains, such as cyber space and outer space, has generated a sharp rise of concern about the implications of such competition and capabilities for strategic stability. This literature review explores the main insights and intellectual currents within the debate.

Roberts, Brad. "Emerging and Disruptive Technologies, Multi-domain Complexity, and Strategic Stability: A Review and Assessment of the Literature." Livermore, CA: Center for Global Security Research (February 2021). https://cgsr.llnl.gov/content/assets/docs/EDT_ST2_BHR_2021.3.16.pdf.

> Over the last couple of decades, Russia, China, and the United States have been engaged in the increasingly competitive pursuit of the military benefits of emerging technologies. This report takes stock of what has been learned by the community of U.S. and allied experts.

*Panel 3: The U.S. Nuclear Posture in 2030: Fit for Purpose?*

- Will the US nuclear posture be "fit for purpose" a decade from now? Why? Why not?
- What factors are likely to affect the modernization pathway between now and 2030?
- Are there additional changes to the U.S. practice of nuclear deterrence that should be considered to help reduce nuclear risks?

Goldstein, William. "The Nuclear Enterprise in the 21st Century." In *Fit for Purpose? The U.S. Strategic Posture in 2030 and Beyond*, edited by Brad Roberts. Center for Global Security Research Occasional Paper (October 2020). https://cgsr.llnl.gov/content/assets/docs/The-US-Strategic-Posture-in-2030-and-Beyond.pdf.

> Goldstein argues that the challenges faced by the enterprise at this moment are numerous and in some ways made more daunting by the uncertainty in our environment. The U.S. must look beyond the current decade and create an enterprise—the people, the infrastructure, the science, and the culture—that will serve the nation's needs well beyond 2030.

Creedon, Madelyn. "Near-Peer Advancements in Space and Nuclear Weapons." Statement to the House Armed Services Committee, Subcommittee on Strategic Forces, Washington, DC (February 23, 2021). https://armedservices.house.gov/2021/2/subcommittee-on-strategic-forces-hearing-near-peer-advancements-in-space-and-nuclear-weapons.

> In the face of the growing nuclear challenges by Russia and China, Creedon recommends the following: try to better understand adversaries, consult with allies, discuss the main security concerns publicly, do not take any options off the table before a comprehensive review process is conducted, and seek to reestablish substantive strategic stability discussions with Russia and China.

Harvey, John R. "Modernizing the U.S. Nuclear Arsenal: The Road to 2030 and Beyond." In *Fit for Purpose? The U.S. Strategic Posture in 2030 and Beyond*, edited by Brad Roberts. Center for Global Security Research Occasional Paper (October 2020). https://cgsr.llnl.gov/content/assets/docs/The-US-Strategic-Posture-in-2030-and-Beyond.pdf.

> Harvey argues that keeping the U.S. nuclear modernization on track for the two decades that modernization will play out remains a key technical and political challenge. There is little flexibility to absorb further triad modernization delay without affecting robust nuclear deterrence in future years.

Hingorani, Sheryl. “21st Century Deterrence: Hedging with Resilience.” In *Fit for Purpose? The U.S. Strategic Posture in 2030 and Beyond*, edited by Brad Roberts. Center for Global Security Research Occasional Paper (October 2020). https://cgsr.llnl.gov/content/assets/docs/The-US-Strategic-Posture-in-2030-and-Beyond.pdf.

Hingorani explores the additional burdens on the complex that would follow a geopolitical or technical surprise, arguing that hedge strategies as so far practiced have not yet adequately addressed the risk of strategic surprise.

U.S. Government Accountability Office. “Defense Nuclear Enterprise – Systems Face Sustainment Challenges, and Actions Are Needed to Effectively Monitor Efforts to Improve the Enterprise.” GAO-20-296 (March 2020). https://www.gao.gov/assets/710/705525.pdf.

This GAO report found that DOD and the military services are experiencing challenges related to sustainment and maintenance of nuclear weapon systems. Both have ongoing and planned initiatives intended to mitigate these challenges, such as improving maintenance processes and sources of supply.

Lowther, Adam and Stephen Cimbala. “Future Technology and Nuclear Deterrence.” Air University: Wild Blue Yonder (February 2020). https://www.airuniversity.af.edu/Wild-Blue-Yonder/Article-Display/Article/2071083/future-technology-and-nuclear-deterrence/.

Whether offset technologies are ultimately subversive of nuclear deterrence or contributory to the complexity of nuclear deterrence remains an issue for future technology developers and governments to decide. The authors note, however, that few states will be able to afford to modernize their nuclear forces and to keep pace with the threat posed by cyber and other new technologies.